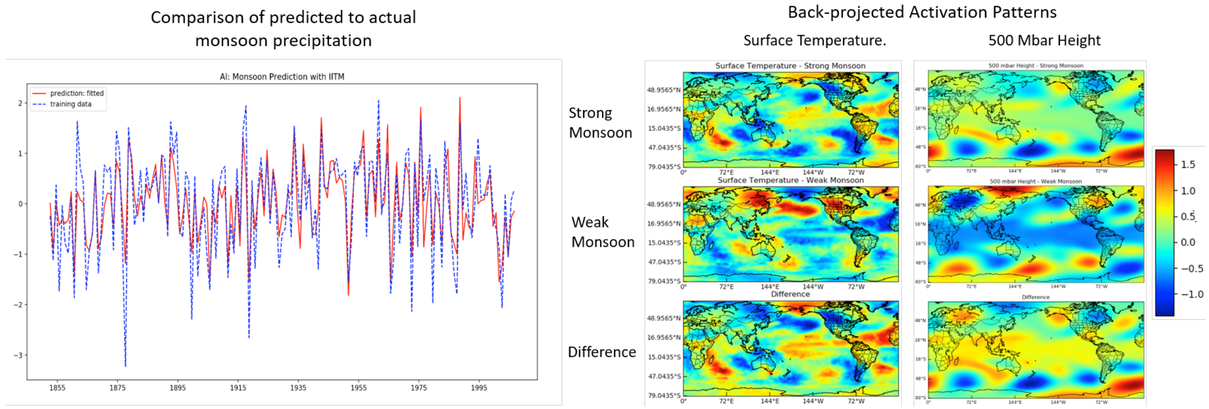
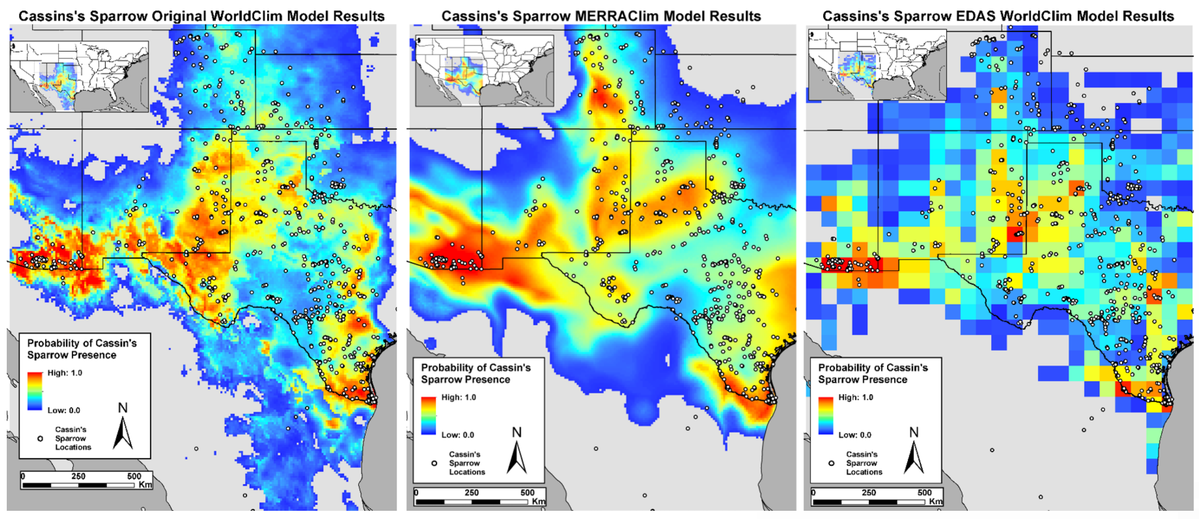
National Aeronautics and
Space Administration

NASA EXPLORES SUPERCOMPUTING

Accelerating Science with AI and Machine Learning



The goal of this research is to explore teleconnections between features in climate data using machine learning techniques. This two-layer, artificial neural network predicts the strength of upcoming monsoon precipitation using 100 years of temperature and precipitation data as input. This research is instrumental in advancing NASA's capabilities for learning new things from large datasets by taking advantage of the high-performance computing available at NASA Goddard Space Flight Center. *Thomas Maxwell, Jian Li, NASA/Goddard*



Species Distribution Models (SDMs) use climate information such as temperature and precipitation to identify habitat suitable for a species of interest. The goal of this research is to use MaxEnt software with three different input datasets (WorldClim, WorldClim augmented with MERRA, and MERRA) to create habitat suitability maps for Cassin's Sparrow in North America. The results indicate that MERRA can be used to produce comparable results to WorldClim (standard dataset used for SDM). *Jian Li, Roger Gill, NASA/Goddard*

Data holdings at NASA are growing at a geometric rate, with an estimated 100 petabytes of Earth science imagery alone. Traditional methods of analyzing these data are insufficient to produce answers in a reasonable time frame. Scientists have turned to Artificial Intelligence and machine learning (AI/ML) methods to facilitate the analysis of the large volumes of data. Here, we present several projects that use various AI/ML methods in concert with high-performance computing (HPC) to derive products and inferences from satellite imagery, model outputs, and other image products. In addition, we will outline our plan to develop a unified approach to data science that incorporates AI/ML.

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